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**DEPARTMENT OF COMMERCE**

**National Oceanic and Atmospheric Administration**

**RIN 0648-XF582**

**Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to Bravo Wharf Recapitalization Project, Year 2**

**AGENCY:** National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

**ACTION:** Notice; issuance of incidental harassment authorization.

**SUMMARY:** In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA) as amended, notification is hereby given that NMFS has issued an incidental harassment authorization (IHA) to the Naval Facilities Engineering Command Southeast and Naval Facilities Engineering Command Atlantic (the Navy) to incidentally harass, by Level B harassment only, marine mammals during construction activities associated with recapitalization of Bravo Wharf, Year 2, in Naval Station Mayport (NSM), Jacksonville, Florida.

**DATES:** This Authorization is effective from March 13, 2018, to March 12, 2019.

**FOR FURTHER INFORMATION CONTACT:** Brianna Elliott, Office of Protected Resources, NMFS, (301) 427-8401. Electronic copies of the application and supporting documents, as well as a list of the references cited in this document, may be obtained online at [www.nmfs.noaa.gov/pr/permits/incidental/construction.htm](http://www.nmfs.noaa.gov/pr/permits/incidental/construction.htm). In case of problems accessing these documents, please call the contact listed above.

**SUPPLEMENTARY INFORMATION:**

## **Background**

Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce (as delegated to NMFS) to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, a notice of a proposed authorization is provided to the public for review.

An authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s), will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant), and if the permissible methods of taking and requirements pertaining to the mitigation, monitoring and reporting of such takings are set forth.

NMFS has defined “negligible impact” in 50 CFR 216.103 as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.

The MMPA states that the term “take” means to harass, hunt, capture, kill or attempt to harass, hunt, capture, or kill any marine mammal.

Except with respect to certain activities not pertinent here, the MMPA defines “harassment” as any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

## **Summary of Request**

On July 12, 2017, NMFS received a request from the Navy for an IHA to take marine mammals incidental to pile driving in association with the Bravo Wharf recapitalization project at NSM, FL. The Navy's request is for take of bottlenose dolphins (*Tursiops truncatus truncatus*) by only Level B harassment. Neither the Navy nor NMFS expect mortality to result from this activity and, therefore, an IHA is appropriate.

NMFS previously issued IHAs to the Navy for similar work at Bravo Wharf (81 FR 52637, 1 December 2016; revised IHA for this activity: 82 FR 11344, 13 March 2017) and Wharf C-2, also located within NSM (80 FR 55598, 8 September 2015; 78 FR 71566, 1 December 2013 and revised IHA for this activity: 79 FR 27863, 1 September 2014). The Navy complied with all the requirements (*e.g.*, mitigation, monitoring, and reporting) of previous IHAs at Bravo Wharf (revised IHA for this activity: 82 FR 11344, 13 March 2017) and at Wharf C-2 (80 FR 55598, 8 September 2015; 79 FR 27863, 1 September 2014) and information regarding their monitoring results may be found at <http://www.nmfs.noaa.gov/pr/permits/incidental/construction.htm>.

This IHA covers one year of a larger project for which the Navy obtained a prior IHA at Bravo Wharf (81 FR 52637, 1 December 2016; revised IHA for this activity: 82 FR 11344, 13 March 2017). The larger project involves recapitalization of Bravo Wharf at three berths in NSM spread across Phase I and Phase II, which involves installing 880 single sheet piles through the two phases and two years of authorizations; this IHA authorizes the second year of construction at Bravo Wharf.

## **Description of Proposed Activity**

Bravo Wharf is a medium draft, general purpose berthing wharf that was constructed in 1970 and lies at the western edge of the NSM turning basin at the mouth of the St. Johns River and adjacent to the Atlantic Ocean. Bravo Wharf is approximately 2,000 feet (ft) long, 125 ft wide, and has a berthing depth of 50 ft mean lower low water. Bravo Wharf is currently in poor condition, and therefore, the Navy requested an IHA in order to conduct necessary repairs at the Wharf via vibratory pile driving, and contingency impact driving if necessary.

This IHA covers one year of construction from March 13, 2018, to March 12, 2019, during which the Navy plans a maximum of 40 days of construction, including 30 days of vibratory pile driving and 10 days of impact driving, to install 234 steel sheet piles. A detailed description of the planned Bravo Wharf recapitalization project is provided in the Federal Register notice for the proposed IHA (82 FR 55990; 27 November 2017). Since that time, no changes have been made to the planned activities reflected in the proposed IHA. Therefore, a detailed description is not provided here. Please refer to that *Federal Register* notice for the description of the specific activity.

### **Comments and Responses**

We published a notice of receipt of the Navy's application and proposed IHA in the *Federal Register* on November 27, 2017 (82 FR 55990). We received one comment, a letter from the Marine Mammal Commission ("the Commission"). The Commission concurred with NMFS's preliminary findings to issue the proposed IHA, but had a comment regarding NMFS's take estimation methodology.

*Comment:* The Commission wrote that NMFS's methodology for estimating marine mammal takes incidental to this activity does not account for NMFS's 24-hour reset policy when counting takes. The Commission added that this is a policy issue rather than computational error,

and notes that NMFS has yet to share new criteria for rounding marine mammal takes as NMFS did in this scenario. They recommended that NMFS share this new methodology and policy with the Commission as soon as possible.

*Response:* NMFS values the Commission's insight and diligence in ensuring NMFS is operating with the best science and policy information, which NMFS believes it is doing. NMFS has received similar comments from the Commission in the past and has provided responses (*e.g.* 82 FR 50628, 1 November 2017; 82 FR 458 11, 2 October 2017; 82 FR 10747, 15 February 2017). NMFS will share rounding criteria with the Commission as soon as possible, and looks forward to engaging with the Commission on this issue in the future.

### **Description of Marine Mammals in the Area of Specified Activities**

There are four marine mammal species which may inhabit or transit through the waters nearby NSM at the mouth of the St. Johns River and in nearby nearshore Atlantic waters. These include the bottlenose dolphin (*Tursiops truncatus truncatus*), Atlantic spotted dolphin (*Stenella frontalis*), North Atlantic right whale (*Eubalaena glacialis*), and humpback whale (*Megaptera novaeangliae*). Multiple additional cetacean species occur in south Atlantic waters but would not be expected to occur in shallow nearshore waters of the action area. In addition, the West Indian manatees may be found in the vicinity of NSM. However, West Indian manatees are managed by the U.S. Fish and Wildlife Service and are not considered further in this document.

Table 1 lists all species with expected potential for occurrence in the vicinity of NSM and summarizes information related to the population or stock, including regulatory status under the MMPA and ESA and potential biological removal (PBR), where known. For taxonomy, we follow Committee on Taxonomy (2017). Sections 3 and 4 of the Navy's application summarize available information regarding status and trends, distribution and habitat preferences, and

behavior and life history, of the potentially affected species. Additional information regarding population trends and threats may be found in NMFS's Stock Assessment Reports (SAR; [www.nmfs.noaa.gov/pr/sars/](http://www.nmfs.noaa.gov/pr/sars/)) and more general information about these species (*e.g.*, physical and behavioral descriptions) may be found on NMFS's website ([www.nmfs.noaa.gov/pr/species/mammals/](http://www.nmfs.noaa.gov/pr/species/mammals/)). Please also refer to the Navy's Marine Resource Assessment for the Charleston/Jacksonville Operating Area, which documents and describes the marine resources that occur in Navy operating areas of the Southeast (DoN 2008). The document is publicly available at [www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/marine\\_resources/marine\\_resource\\_assessments.html](http://www.navfac.navy.mil/products_and_services/ev/products_and_services/marine_resources/marine_resource_assessments.html) (accessed October 12, 2017). A detailed description of the species likely to be affected by pile driving at Bravo Wharf, including brief introductions to the species and relevant stocks as well as available information regarding population trends and threats, and information regarding local occurrence, were provided in the *Federal Register* notice for the proposed IHA (82 FR 55990; 27 November 2017). Since that time, NMFS published Draft Stock Assessment Reports with several new abundances and information for several species occurring in the vicinity of NSM (82 FR 60181; 19 December 2017); therefore, information in Table 1 below reflects any new information in the draft SARs. Please refer to the proposed *Federal Register* notice for descriptions of the species below (82 FR 55990; 27 November 2017).

**Table 1—Marine Mammals Potentially Present in the Vicinity of NSM**

Common name	Scientific name	Stock	ESA/MMPA status; Strategic (Y/N) <sup>1</sup>	Stock abundance (CV, N <sub>min</sub> , most recent abundance survey) <sup>2</sup>	PBR	Annual M/SI <sup>3</sup>
Order Cetartiodactyla – Cetacea – Superfamily Mysticeti (baleen whales)						

Family Eschrichtiidae						
<i>North Atlantic Right Whale</i>	<i>Eubalaena glacialis</i>	Western North Atlantic	E/D; Y	458 (0; 455; n/a)	1.4	5.36
<i>Humpback whale</i>	<i>Megaptera novaeangliae</i>	Gulf of Maine	-; Y	335 (0; 239; 2011)	3.7	8.5
<i>Superfamily Odontoceti (toothed whales, dolphins, and porpoises)</i>						
Family Delphinidae						
<i>Atlantic Spotted Dolphin</i>	<i>Stenella frontalis</i>	Western North Atlantic	-; N	44,715 (0.43; 31,610; 2011)	316	0
Common bottlenose dolphin	<i>Tursiops truncatus truncatus</i>	Jacksonville Estuarine System	-; Y	412 (0.06; unk; 1994-97) <sup>4</sup>	unk	1.2
Common bottlenose dolphin	<i>Tursiops truncatus truncatus</i>	Western North Atlantic, northern Florida coastal	-/D; Y	877 (0.49; 595; 2016)	6	0.46
Common bottlenose dolphin	<i>Tursiops truncatus truncatus</i>	Western North Atlantic, offshore	-; N	77,532 (0.40; 56,053; 2011)	561	39.4 (0.29)
Common bottlenose dolphin	<i>Tursiops truncatus truncatus</i>	Western North Atlantic, southern migratory coastal	-/D; Y	3,751 (0.60; 2,353; 2016)	23	0-14.3

1 - Endangered Species Act (ESA) status: Endangered (E), Threatened (T)/MMPA status: Depleted (D). A dash (-) indicates that the species is not listed under the ESA or designated as depleted under the MMPA. Under the MMPA, a strategic stock is one for which the level of direct human-caused mortality exceeds PBR or which is determined to be declining and likely to be listed under the ESA within the foreseeable future. Any species or stock listed under the ESA is automatically designated under the MMPA as depleted and as a strategic stock.

2 - NMFS marine mammal stock assessment reports online at: [www.nmfs.noaa.gov/pr/sars/](http://www.nmfs.noaa.gov/pr/sars/). CV is coefficient of variation; Nmin is the minimum estimate of stock abundance. In some cases, CV is not applicable.

3 - These values, found in NMFS's SARs, represent annual levels of human-caused mortality plus serious injury from all sources combined (e.g., commercial fisheries, ship strike). Annual M/SI often cannot be determined precisely and is in some cases presented as a minimum value or range. A CV associated with estimated mortality due to commercial fisheries is presented in some cases.

4 - This abundance estimate is considered an overestimate because it includes non- and seasonally-resident animals.

*NOTE - Italicized species are not expected to be taken or proposed for authorization*

## Potential Effects of Specified Activities on Marine Mammals and their Habitat

The effects of underwater noise from vibratory and impact pile driving at Bravo Wharf have the potential to result in behavioral harassment of marine mammals in the vicinity of the action area and temporary increases in underwater noise levels around the turning basin. However, construction activity is not expected to cause serious injury or mortality to marine mammals, nor will it permanently elevate sound levels in the turning basin. Furthermore, the turning basin is an industrialized, developed basin and is thus not known to be an important

foraging site or other habitat; therefore, any temporary impacts to the turning basin and surrounding ensonified waters are not expected to have significant or long-lasting impacts to marine mammals. The *Federal Register* notice for the proposed IHA (82 FR 55990; 27 November 2017) included a discussion of the effects of anthropogenic noise on marine mammals, and therefore, that information is not repeated here; please refer to the Federal Register notice for that information.

### **Estimated Take**

This section provides an estimate of the number of incidental takes authorized through the IHA, which will inform both NMFS's consideration of whether the number of takes is "small" and the negligible impact determination.

Harassment is the only type of take expected to result from these activities. Except with respect to certain activities not pertinent here, section 3(18) of the MMPA defines "harassment" as: any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering (Level B harassment).

Authorized takes are by Level B harassment only, in the form of disruption of behavioral patterns for individual marine mammals resulting from exposure to vibratory and impact pile driving. Based on the nature of the activity, Level A harassment is neither anticipated nor authorized.

In order to estimate the potential incidents of take that may occur incidental to the specified activity, we must first estimate the extent of the sound field that may be produced by

the activity and then consider in combination with information about marine mammal density or abundance in the project area. Below we describe how the take is estimated.

Described in the most basic way, we estimate take by considering: 1) acoustic thresholds above which NMFS believes the best available science indicates marine mammals will be behaviorally harassed or incur some degree of permanent hearing impairment; 2) the area or volume of water that will be ensonified above these levels in a day; 3) the density or occurrence of marine mammals within these ensonified areas; and, 4) and the number of days of activities. Below, we describe these components in more detail and present the authorized take estimate.

#### *Acoustic Thresholds*

Using the best available science, NMFS has developed acoustic thresholds that identify the received level of underwater sound above which exposed marine mammals would be reasonably expected to be behaviorally harassed (equated to Level B harassment) or to incur PTS of some degree (equated to Level A harassment) (Table 2).

*Level B Harassment for non-explosive sources* – Though significantly driven by received level, the onset of behavioral disturbance from anthropogenic noise exposure is also informed to varying degrees by other factors related to the source (*e.g.*, frequency, predictability, duty cycle), the environment (*e.g.*, bathymetry), and the receiving animals (hearing, motivation, experience, demography, behavioral context) and can be difficult to predict (Southall *et al.*, 2007, Ellison *et al.*, 2011). NMFS uses a generalized acoustic threshold based on received level to estimate the onset of behavioral harassment. NMFS predicts that marine mammals are likely to be behaviorally harassed in a manner we consider Level B harassment when exposed to underwater anthropogenic noise above received levels of 120 dB re 1  $\mu$ Pa (rms) for continuous (*e.g.*

vibratory pile-driving, drilling) and above 160 dB re 1  $\mu$ Pa (rms) for non-explosive impulsive (e.g., seismic airguns) or intermittent (e.g., scientific sonar) sources.

Recapitalization of Bravo Wharf includes the use of continuous (vibratory pile driving) and impulsive (impact pile driving) sources, and therefore the 120 and 160 dB re 1  $\mu$ Pa (rms) thresholds are applicable.

*Level A harassment for non-explosive sources* – NMFS’s Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Technical Guidance, 2016) identifies dual criteria to assess auditory injury (Level A harassment) to five different marine mammal groups (based on hearing sensitivity) as a result of exposure to noise from two different types of sources (impulsive or non-impulsive) (Table 2). The Navy’s proposed recapitalization of Bravo Wharf includes the use of impulsive (impact pile driving) and non-impulsive (vibratory pile driving) sources.

These thresholds were developed by compiling and synthesizing the best available science and soliciting input multiple times from both the public and peer reviewers to inform the final product, and are provided in the table below. The references, analysis, and methodology used in the development of the thresholds are described in NMFS 2016 Technical Guidance, which may be accessed at: <http://www.nmfs.noaa.gov/pr/acoustics/guidelines.htm>.

**Table 2. Thresholds identifying the onset of Permanent Threshold Shift**

Hearing Group	PTS Onset Thresholds	
	Impulsive	Non-impulsive
<b>Low-Frequency (LF) Cetaceans</b>	$L_{pk,flat}$ : 219 dB $L_{E,LF,24h}$ : 183 dB	$L_{E,LF,24h}$ : 199 dB
<b>Mid-Frequency (MF) Cetaceans</b>	$L_{pk,flat}$ : 230 dB $L_{E,MF,24h}$ : 185 dB	$L_{E,MF,24h}$ : 198 dB

<b>High-Frequency (HF) Cetaceans</b>	$L_{pk,flat}$ : 202 dB $L_{E,HF,24h}$ : 155 dB	$L_{E,HF,24h}$ : 173 dB
<p>* Dual metric acoustic thresholds for impulsive sounds: Use whichever results in the largest isopleth for calculating PTS onset. If a non-impulsive sound has the potential of exceeding the peak sound pressure level thresholds associated with impulsive sounds, these thresholds should also be considered.</p> <p>Note: Peak sound pressure (<math>L_{pk}</math>) has a reference value of 1 <math>\mu</math>Pa, and cumulative sound exposure level (LE) has a reference value of 1 <math>\mu</math>Pa<sup>2</sup>s. In this Table, thresholds are abbreviated to reflect American National Standards Institute standards (ANSI 2013). However, peak sound pressure is defined by ANSI as incorporating frequency weighting, which is not the intent for this Technical Guidance. Hence, the subscript “flat” is being included to indicate peak sound pressure should be flat weighted or unweighted within the generalized hearing range. The subscript associated with cumulative sound exposure level thresholds indicates the designated marine mammal auditory weighting function (LF, MF, and HF cetaceans, and PW and OW pinnipeds) and that the recommended accumulation period is 24 hours. The cumulative sound exposure level thresholds could be exceeded in a multitude of ways (<i>i.e.</i>, varying exposure levels and durations, duty cycle). When possible, it is valuable for action proponents to indicate the conditions under which these acoustic thresholds will be exceeded.</p>		

### *Ensonified Area*

Here, we describe operational and environmental parameters of the activity that will feed into identifying the area ensonified above the acoustic thresholds.

### *Distance to Sound Thresholds*

*Underwater Sound Propagation Formula*—Pile driving generates underwater noise that can potentially result in disturbance to marine mammals in the project area. Transmission loss (TL) is the decrease in acoustic intensity as an acoustic pressure wave propagates out from a source. TL parameters vary with frequency, temperature, sea conditions, current, source and receiver depth, water depth, water chemistry, and bottom composition and topography. The general formula for underwater TL is:

$$TL = B * \log_{10} (R1/R2),$$

Where:

R1 = the distance of the modeled SPL from the driven pile, and

R2 = the distance from the driven pile of the initial measurement.

This formula neglects loss due to scattering and absorption, which is assumed to be zero here.

The degree to which underwater sound propagates away from a sound source is dependent on a variety of factors, most notably the water bathymetry and presence or absence of reflective or absorptive conditions including in-water structures and sediments. Spherical spreading occurs in a perfectly unobstructed (free-field) environment not limited by depth or water surface, resulting in a 6 dB reduction in sound level for each doubling of distance from the source ( $20 \cdot \log[\text{range}]$ ). Cylindrical spreading occurs in an environment in which sound propagation is bounded by the water surface and sea bottom, resulting in a reduction of 3 dB in sound level for each doubling of distance from the source ( $10 \cdot \log[\text{range}]$ ). A practical spreading value of fifteen is often used under conditions, such as at the NSM turning basin, where water increases with depth as the receiver moves away from the shoreline, resulting in an expected propagation environment that would lie between spherical and cylindrical spreading loss conditions. Practical spreading loss (4.5 dB reduction in sound level for each doubling of distance) is assumed here.

*Underwater Sound*—The intensity of pile driving sounds is greatly influenced by factors such as the type of piles, hammers, and the physical environment in which the activity takes place. A number of studies, primarily on the west coast, have measured sound produced during underwater pile driving projects. However, these data are largely for impact driving of steel pipe piles and concrete piles as well as vibratory driving of steel pipe piles. Vibratory driving of steel sheet piles was monitored during the first year of construction at the nearby Wharf C-2 at Naval Station Mayport during 2015. Measurements were conducted from a small boat in the turning

basin and from the construction barge itself. Average SPLs for steel sheet piles ranged from 135 to 158 dB (DoN 2015) and SPLs for a 10-second period of driving averaged 156 dB re 1μPa rms (DoN, 2017a). No impact driving was measured at this location; therefore, proxy levels for impact driving have been calculated from other available source levels.

In order to determine reasonable SPLs and their associated effects on marine mammals that are likely to result from impact pile driving at NSM, we considered existing measurements from similar physical environments (sandy sediments and water depths greater than 15 ft) for driving of steel sheet piles (all measured at 10 m; *e.g.*, Laughlin, 2005a, 2005b; Illingworth and Rodkin, 2010, 2012, 2013; CalTrans 2012; CalTrans 2015). Proxy source values based on similarity to the physical environment at NSM and measurement location in the mid-water column were selected for acoustic modeling: 156 dB for vibratory driving (DoN 2017a) and 190 dB for impact driving (CalTrans 2015). All calculated distances to and the total area encompassed by the marine mammal sound thresholds are provided in Table 3.

**Table 3. Distance to Relevant Underwater Sound Tresholds and Areas of Ensonification**

Pile Type	Method	Threshold	Distance (m)	Area (km <sup>2</sup> )
Steel sheet piles	Vibratory	MF Level A (injury): 198 dB SELcum	0.1	-
		Level B (behavior): 120 dB re 1μPa rms	2,512	1.3550776
	Impact (contingency only)	MF Level A (injury): 185 dB SELcum	1.7	-
		Level B (behavior): 160 dB re 1μPa rms	1,000	0.5313217

<sup>1</sup> Sound pressure levels used for calculations are 156 dB rms and 190 dB rms for vibratory and impact driving, respectively.

<sup>2</sup> Level B areas of ensonification were calculated using the practical spreading loss model described above.

<sup>3</sup> Level A areas of ensonification were calculated using NOAA's Acoustic Criteria Spreadsheet (see Appendix D of the Navy's application). To calculate the distance to Level A injury for vibratory driving, the Navy assumed a source level of 156 dB rms at 10 m, a transmission loss of 15logR, 20 minutes of activity within a 24-hour period, a weighting factor adjustment (WFA) of 2.5, and transmission loss of 15logR. To calculate Level A injury for impact driving, the Navy assumed a SL of 190 dB rms at 10 m, a

100 msec pulse duration, 1 pile driven per day with 20 strikes, a WFA of 2.0, and transmission loss of  $15\log R$ .

The Mayport turning basin does not represent open water, or free field, conditions.

Therefore, sounds would attenuate as per the confines of the basin, and may only reach the full estimated distances to the harassment thresholds via the narrow, east-facing entrance channel.

Distances shown in Table 3 are estimated for free-field conditions, but areas are calculated per the actual conditions of the action area. See Figures 6-1 and 6-2 of the Navy's application for a depiction of areas in which each underwater sound threshold is predicted to occur at the project area due to pile driving.

#### *Marine Mammal Occurrence*

In this section we provide the information about the presence, density, or group dynamics of marine mammals that will inform the take calculations.

#### *Marine Mammal Densities*

For all species, the best scientific information available was considered for use in the marine mammal take assessment calculations. All densities for marine mammals with the possibility of occurring in the project area were calculated from the Navy's Marine Species Density Database and Technical Report (DoN 2017b). Density for bottlenose dolphins is derived from site-specific surveys conducted by the Navy (see Appendix C of the Navy's application for more information); it is not currently possible to identify observed individuals to stock. This survey effort consists of 24 half-day observation periods covering mornings and afternoons during four seasons (December 10-13, 2012, March 4-7, 2013, June 3-6, 2013, and September 9-12, 2013). During each observation period, two observers (a primary observer at an elevated observation point and a secondary observer at ground level) monitored for the presence of

marine mammals in the turning basin (0.712 km<sup>2</sup>) and an additional grid east of the basin entrance. Observers tracked marine mammal movements and behavior within the observation area, with observations recorded for five-minute intervals every half-hour. Morning sessions typically ran from 7 to 11:30 and afternoon sessions from 1 to 5:30.

Most observations of bottlenose dolphins were of individuals or pairs, although larger groups were occasionally observed (median number of dolphins observed ranged from 1-3.5 across seasons). Densities were calculated using observational data from the primary observer supplemented with data from the secondary observer for grids not visible by the primary observer. Season-specific density was then adjusted by applying a correction factor for observer error (*i.e.*, perception bias). The seasonal densities range from 1.98603 (winter) to 4.15366 (summer) dolphins/km<sup>2</sup>. We conservatively use the largest density value to assess take, as the Navy does not have specific information about when in-water work may occur during the period of validity.

#### *Take Calculation and Estimation*

Here we describe how the information provided above is brought together to produce a quantitative take estimate.

The following assumptions are made when estimating potential incidents of take:

- All marine mammal individuals potentially available are assumed to be present within the relevant area, and thus incidentally taken;
- An individual can only be taken once during a 24-h period;
- There will be 30 total days of vibratory driving and 10 days of contingency of impact pile driving;

- Exposures to sound levels at or above the relevant thresholds equate to take, as defined by the MMPA.

The estimation of marine mammal takes typically uses the following calculation:

Exposure estimate (rounded to the nearest whole number) =  $n * ZOI * \text{total activity days}$

Where:

$n$  = density estimate used for each species/season

$ZOI$  = sound threshold  $ZOI$  area; the area encompassed by all locations where the SPLs equal or exceed the threshold being evaluated

The  $ZOI$  impact area is estimated using the relevant distances in Table 3, taking into consideration the possible affected area with attenuation due to the constraints of the basin. Because the basin restricts sound from propagating outward, with the exception of the east-facing entrance channel, the radial distances to thresholds are not generally reached.

There are a number of reasons why estimates of potential incidents of take may be conservative, assuming that available density or abundance estimates and estimated  $ZOI$  areas are accurate. We assume, in the absence of information supporting a more refined conclusion, that the output of the calculation represents the number of individuals that may be taken by the specified activity. In fact, in the context of stationary activities such as pile driving and in areas where resident animals may be present, this number more realistically represents the number of incidents of take that may accrue to a smaller number of individuals. While pile driving can occur any day throughout the in-water work window, and the analysis is conducted on a per day basis, only a fraction of that time (typically a matter of hours on any given day) is actually spent pile driving. The potential effectiveness of mitigation measures in reducing the number of takes

is typically not quantified in the take estimation process. For these reasons, these take estimates may be conservative.

The quantitative exercise described above indicates that no incidents of Level A harassment would be expected, independent of the implementation of required mitigation measures. See Table 4 for total estimated incidents of take.

**Table 4. Calculations for Incidental Take Estimation**

Species	n (animals/km <sup>2</sup> )	Activity	ZOI	Authorized takes <sup>1</sup>
Phase II (40 days)				
Bottlenose dolphin <sup>2</sup>	4.15366	Vibratory driving (30 days)	1.350776	169
Bottlenose dolphin <sup>2</sup>	4.15366	Contingency impact driving (10 days)	0.5313217	22
Total exposures				191

<sup>1</sup> The product of n \* ZOI \* total activity days (rounded to the nearest whole number) is used to estimate the number of takes.

<sup>2</sup> It is impossible to estimate from available information which stock these takes may accrue to.

## Mitigation

In order to issue an IHA under section 101(a)(5)(D) of the MMPA, NMFS must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stock for taking for certain subsistence uses (latter not applicable for this action). NMFS regulations require applicants for incidental take authorizations to include information about the availability and feasibility (economic and technological) of equipment, methods, and

manner of conducting such activity or other means of effecting the least practicable adverse impact upon the affected species or stocks and their habitat (50 CFR 216.104(a)(11)).

In evaluating how mitigation may or may not be appropriate to ensure the least practicable adverse impact on species or stocks and their habitat, as well as subsistence uses where applicable, we carefully consider two primary factors:

1) The manner in which, and the degree to which, the successful implementation of the measure(s) is expected to reduce impacts to marine mammals, marine mammal species or stocks, and their habitat. This considers the nature of the potential adverse impact being mitigated (likelihood, scope, range). It further considers the likelihood that the measure will be effective if implemented (probability of accomplishing the mitigating result if implemented as planned) the likelihood of effective implementation (probability implemented as planned). and;

2) The practicability of the measures for applicant implementation, which may consider such things as cost, impact on operations, and, in the case of a military readiness activity, personnel safety, practicality of implementation, and impact on the effectiveness of the military readiness activity.

Measurements from similar pile driving events were coupled with practical spreading loss to estimate zones of influence (ZOI; see *Estimated Take*); these values were used to develop mitigation measures for pile driving activities at NSM. The ZOIs effectively represent the mitigation zone that would be established around each pile to prevent Level A harassment to marine mammals, while providing estimates of the areas within which Level B harassment might occur. In addition to the specific measures described later in this section, the Navy would conduct briefings between construction supervisors and crews, marine mammal monitoring team, and Navy staff prior to the start of all pile driving activity, and when new personnel join the

work, in order to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures.

### *Monitoring and Shutdown for Pile Driving*

*Shutdown Zone*—For all pile driving activities, the Navy will establish a shutdown zone intended to contain the area in which SPLs equal or exceed the acoustic injury criteria for mid-frequency hearing specialists (*e.g.* bottlenose dolphins) at 198 dB SEL<sub>cum</sub> for vibratory driving and 185 dB SEL<sub>cum</sub> for impact driving. The purpose of a shutdown zone is to define an area within which shutdown of activity would occur upon sighting of a marine mammal (or in anticipation of an animal entering the defined area), thus preventing injury of marine mammals (as described previously under *Potential Effects of the Specified Activity on Marine Mammals*, serious injury or death are unlikely outcomes even in the absence of mitigation measures). Modeled radial distances for shutdown zones are shown in Table 3. However, a minimum shutdown zone of 15 m (which is larger than the maximum predicted injury zone) will be established during all pile driving activities, regardless of the estimated zone. Vibratory pile driving activities are not predicted to produce sound exceeding 198 dB SEL<sub>cum</sub> threshold, but these precautionary measures are intended to prevent the already unlikely possibility of physical interaction with construction equipment and to further reduce any possibility of acoustic injury.

*Disturbance Zone*—Disturbance zones are the areas in which SPLs equal or exceed 160 and 120 dB rms (for impulse and continuous sound, respectively). Disturbance zones provide utility for monitoring conducted for mitigation purposes (*i.e.*, shutdown zone monitoring) by establishing monitoring protocols for areas adjacent to the shutdown zones. Monitoring of disturbance zones enables observers to be aware of and communicate the presence of marine mammals in the project area but outside the shutdown zone and thus prepare for potential

shutdowns of activity. However, the primary purpose of disturbance zone monitoring is for documenting incidents of Level B harassment; disturbance zone monitoring is discussed in greater detail later (see *Monitoring and Reporting*). Nominal radial distances for disturbance zones are shown in Table 3. Given the size of the disturbance zone for vibratory pile driving, it is impossible to guarantee that all animals would be observed or to make comprehensive observations of fine-scale behavioral reactions to sound, and only a portion of the zone (*e.g.*, what may be reasonably observed by visual observers stationed within the turning basin) would be observed.

In order to document observed incidents of harassment, monitors record all marine mammal observations, regardless of location. The observer's location, as well as the location of the pile being driven, is known from a GPS. The location of the animal is estimated as a distance from the observer, which is then compared to the location from the pile. It may then be estimated whether the animal was exposed to sound levels constituting incidental harassment on the basis of predicted distances to relevant thresholds in post-processing of observational and acoustic data, and a precise accounting of observed incidences of harassment created. This information may then be used to extrapolate observed takes to reach an approximate understanding of actual total takes.

*Monitoring Protocols*—Monitoring would be conducted before, during, and after pile driving activities. In addition, observers shall record all incidents of marine mammal occurrence within the ZOI and shall document any behavioral reactions in concert with distance from piles being driven. Observations made outside the shutdown zone will not result in shutdown; that pile segment would be completed without cessation, unless the animal approaches or enters the shutdown zone, at which point all pile driving activities would be halted. Monitoring will take

place from 15 minutes prior to initiation through 30 minutes post-completion of pile driving activities. Pile driving activities include the time to install or remove a single pile or series of piles, as long as the time elapsed between uses of the pile driving equipment is no more than thirty minutes. Please see the Monitoring Plan ([www.nmfs.noaa.gov/pr/permits/incidental/construction.htm](http://www.nmfs.noaa.gov/pr/permits/incidental/construction.htm)), developed by the Navy in agreement with NMFS, for full details of the monitoring protocols.

The following additional measures apply to visual monitoring:

(1) Marine mammal observer (MMO) requirements for this construction action are as follows:

- (a) The Navy will use two MMOs during all construction activity.
- (b) At least one observer must have prior experience working as an observer.
- (c) Other observers may substitute education (undergraduate degree in biological science or related field) or training for experience.
- (d) Where a team of three or more observers are required, one observer should be designated as lead observer or monitoring coordinator. The lead observer must have prior experience working as an observer.

(2) Qualified MMOs are trained biologists, and need the following additional minimum qualifications:

- (a) Visual acuity in both eyes (correction is permissible) sufficient for discernment of moving targets at the water's surface with ability to estimate target size and distance; use of binoculars may be necessary to correctly identify the target;
- (b) Ability to conduct field observations and collect data according to assigned protocols

(c) Experience or training in the field identification of marine mammals, including the identification of behaviors;

(d) Sufficient training, orientation, or experience with the construction operation to provide for personal safety during observations;

(e) Writing skills sufficient to prepare a report of observations including but not limited to the number and species of marine mammals observed; dates and times when in-water construction activities were conducted; dates and times when in-water construction activities were suspended to avoid potential incidental injury from construction sound of marine mammals observed within a defined shutdown zone; and marine mammal behavior; and

(f) Ability to communicate orally, by radio or in person, with project personnel to provide real-time information on marine mammals observed in the area as necessary.

(2) Prior to the start of pile driving activity, the shutdown zone will be monitored for fifteen minutes to ensure that it is clear of marine mammals. Pile driving will only commence once observers have declared the shutdown zone clear of marine mammals; animals will be allowed to remain in the shutdown zone (*i.e.*, must leave of their own volition) and their behavior will be monitored and documented. The shutdown zone may only be declared clear, and pile driving started, when the entire shutdown zone is visible (*i.e.*, when not obscured by dark, rain, fog, *etc.*). In addition, if such conditions should arise during impact pile driving that is already underway, the activity would be halted.

(3) If a marine mammal approaches or enters the shutdown zone during the course of pile driving operations, activity will be halted and delayed until either the animal has voluntarily left and been visually confirmed beyond the shutdown zone or 15 minutes (30 minutes in the case of a large whale) have passed without re-detection of the animal. Should any marine mammal not

authorized for Level B harassment in this IHA enter the ensonified area, pile driving will cease until the animal(s) leaves the area and will resume after the observer has determined through re-sighting or by waiting 15 minutes that the animal moved outside the ensonified area. Monitoring will be conducted throughout the time required to drive a pile.

(4) Monitoring of the shutdown zone will continue for 30 minutes following completion of construction activity.

(5) If a species for which authorization has not been granted (i.e. North Atlantic right whales, Atlantic spotted dolphins, and humpback whales) or for which authorization has been granted but meets take limits approaches or enters the Level B harassment zone, construction activity must cease and the Navy shall contact the Office of Protected Resources, NMFS.

*Soft-Start*—The use of a soft start procedure is believed to provide additional protection to marine mammals by warning or providing a chance to leave the area prior to the hammer operating at full capacity, and typically involves a requirement to initiate sound from the hammer at reduced energy followed by a waiting period. This procedure is repeated two additional times. It is difficult to specify the reduction in energy for any given hammer because of variation across drivers and, for impact hammers, the actual number of strikes at reduced energy will vary because operating the hammer at less than full power results in “bouncing” of the hammer as it strikes the pile, resulting in multiple “strikes.” For impact driving, we require an initial set of three strikes from the impact hammer at reduced energy, followed by a 30-second waiting period, then two subsequent three strike sets. Soft start will be required at the beginning of each day's impact pile driving work and at any time following a cessation of impact pile driving of thirty minutes or longer.

Based on our evaluation of the applicant's proposed measures, NMFS has determined that the mitigation measures provide the means effecting the least practicable impact on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

### **Monitoring and Reporting**

In order to issue an IHA for an activity, section 101(a)(5)(D) of the MMPA states that NMFS must set forth requirements pertaining to the monitoring and reporting of such taking. The MMPA implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for authorizations must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and of the level of taking or impacts on populations of marine mammals that are expected to be present in the action area. Effective reporting is critical both to compliance as well as ensuring that the most value is obtained from the required monitoring.

Monitoring and reporting requirements prescribed by NMFS should contribute to improved understanding of one or more of the following:

- Occurrence of marine mammal species or stocks in the area in which take is anticipated (*e.g.*, presence, abundance, distribution, density);
- Nature, scope, or context of likely marine mammal exposure to potential stressors/impacts (individual or cumulative, acute or chronic), through better understanding of: (1) action or environment (*e.g.*, source characterization, propagation, ambient noise); (2) affected species (*e.g.*, life history, dive patterns); (3) co-occurrence of marine mammal species with the action; or (4) biological or behavioral context of exposure (*e.g.*, age, calving or feeding areas);

- Individual marine mammal responses (behavioral or physiological) to acoustic stressors (acute, chronic, or cumulative), other stressors, or cumulative impacts from multiple stressors;
- How anticipated responses to stressors impact either: (1) long-term fitness and survival of individual marine mammals; or (2) populations, species, or stocks;
- Effects on marine mammal habitat (*e.g.*, marine mammal prey species, acoustic habitat, or other important physical components of marine mammal habitat);
- Mitigation and monitoring effectiveness.

The Navy's proposed monitoring and reporting is also described in their Marine Mammal Monitoring Plan, on the Internet at [www.nmfs.noaa.gov/pr/permits/incidental/construction.htm](http://www.nmfs.noaa.gov/pr/permits/incidental/construction.htm).

#### *Visual Marine Mammal Observations*

The Navy will collect sighting data and behavioral responses to construction for marine mammal species observed in the region of activity during the period of activity. All marine mammal observers (MMOs) will be trained in marine mammal identification and behaviors and are required to have no other construction-related tasks while conducting monitoring. The Navy will monitor the shutdown zone and disturbance zone before, during, and after pile driving, with observers located at the best practicable vantage points. Based on our requirements, the Navy would implement the following procedures for pile driving:

- The two MMOs would be located at the best vantage point(s) in order to properly see the entire shutdown zone and as much of the disturbance zone as possible;
- During all observation periods, observers will use binoculars and the naked eye to search continuously for marine mammals;

- If the shutdown zones are obscured by fog or poor lighting conditions, pile driving at that location will not be initiated until that zone is visible. Should such conditions arise while impact driving is underway, the activity would be halted; and
- The shutdown and disturbance zones around the pile will be monitored for the presence of marine mammals before, during, and after any pile driving or removal activity.
- In the event that Navy discovers an injured or dead marine mammal, and the lead observer determines that the injury or death is not associated with or related to the activities authorized in the IHA (e.g., previously wounded animal, carcass with moderate to advanced decomposition, scavenger damage), the Navy shall report the incident to the Office of Protected Resources, NMFS, and the Southeast Fisheries Science Center Stranding Coordinator, NMFS, within 24 hours of the discovery. Navy shall provide photographs or video footage or other documentation of the stranded animal sighting to NMFS. The Navy can continue its operations under such a case.
- Likewise, if the Navy discovers an injured or dead marine mammal, and the lead observer determines that the cause of the injury or death is unknown and the death is relatively recent (e.g., in less than a moderate state of decomposition), the Navy shall immediately report the incident to the Office of Protected Resources, NMFS, and the Southeast Fisheries Science Center Stranding Coordinator, NMFS.

Individuals implementing the monitoring protocol will assess its effectiveness using an adaptive approach. The monitoring biologists will use their best professional judgment throughout implementation and seek improvements to these methods when deemed appropriate. Any modifications to protocol will be coordinated between NMFS and the Navy.

### *Data Collection*

We require that observers use approved data forms. Among other pieces of information, the Navy will record detailed information about any implementation of shutdowns, including the distance of animals to the pile and description of specific actions that ensued and resulting behavior of the animal, if any. In addition, the Navy will attempt to distinguish between the number of individual animals taken and the number of incidences of take. We require that, at a minimum, the following information be collected on the sighting forms:

- Date and time that monitored activity begins or ends;
- Construction activities occurring during each observation period;
- Weather parameters (*e.g.*, percent cover, visibility);
- Water conditions (*e.g.*, sea state, tide state);
- Species, numbers, and, if possible, sex and age class of marine mammals;
- Description of any observable marine mammal behavior patterns, including bearing and direction of travel, and if possible, the correlation to SPLs;
- Duration of marine mammals within the shutdown area;
- Distance from pile driving activities to marine mammals and distance from the marine mammals to the observation point;
- Description of implementation of mitigation measures (*e.g.*, shutdown or delay);
- Locations of all marine mammal observations; and
- Other human activity in the area.

### *Reporting*

A draft report would be submitted to NMFS within 90 days of the completion of marine mammal monitoring, or sixty days prior to the requested date of issuance of any future IHA for projects at the same location, whichever comes first. The report will include marine mammal observations pre-activity, during-activity, and post-activity during pile driving days, and will also provide descriptions of any behavioral responses to construction activities by marine mammals and a complete description of all mitigation shutdowns and the results of those actions and an extrapolated total take estimate based on the number of marine mammals observed during the course of construction. A final report must be submitted within thirty days following resolution of comments on the draft report.

#### *Prior Monitoring*

As required, the Navy submitted a monitoring report for the first year of construction at Bravo Wharf in advance of sixty days prior to the requested date of issuance for this IHA. They met all mitigation, monitoring, and reporting protocols. Sixty takes occurred by Level B harassment to bottlenose dolphins—the only species for which take was authorized—and takes were below the 111 authorized number of takes for this particular stage (Phase II) of construction. Additionally, the Navy met all monitoring requirements for similar construction activity at nearby Wharf C-2 in NSM (80 FR 55598, 8 September 2015; 78 FR 71566, 1 December 2013 and revised IHA for this activity: 79 FR 27863, 1 September 2014). During the course of both IHAs at Wharf C-2, the Navy did not exceed authorized take levels. The first IHA (covering the period of May 26 to August 17, 2015) authorized incidental take of 365 bottlenose dolphins and 95 Atlantic spotted dolphins by Level B harassment. Observers documented 272 bottlenose dolphins based on derived correction factors, and no Atlantic spotted dolphins were observed (DoN 2015b). As mentioned in the *Estimated Take* section, the Navy also monitored

underwater acoustics during vibratory installation of king piles and steel sheet piles during the period of this IHA at NSM; the sound pressure level average ranged from 135 to 158 dB and averaged 21 seconds to install a sheet pile (DoN 2015b). Collection of underwater sound and production of a subsequent report was not required under the respective IHA, and is thus not discussed below for the second IHA at Wharf C-2.

An IHA for the second year of construction at Wharf C-2 (covering a period from September 8, 2015 to September 7, 2016) authorized incidental take of 304 total bottlenose dolphins. After applying correction factors to derive a total number of estimated takes, estimated Level B takes were calculated to be 128 bottlenose dolphins (DoN 2016).

### **Negligible Impact Analysis and Determination**

NMFS has defined negligible impact as an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival (50 CFR 216.103). A negligible impact finding is based on the lack of likely adverse effects on annual rates of recruitment or survival (*i.e.*, population-level effects). An estimate of the number of takes alone is not enough information on which to base an impact determination. In addition to considering estimates of the number of marine mammals that might be “taken” through harassment, NMFS considers other factors, such as the likely nature of any responses (*e.g.*, intensity, duration), the context of any responses (*e.g.*, critical reproductive time or location, migration), as well as effects on habitat, and the likely effectiveness of the mitigation. We also assess the number, intensity, and context of estimated takes by evaluating this information relative to population status. Consistent with the 1989 preamble for NMFS’s implementing regulations (54 FR 40338; September 29, 1989), the impacts from other past and ongoing anthropogenic activities are

incorporated into this analysis via their impacts on the environmental baseline (*e.g.*, as reflected in the regulatory status of the species, population size and growth rate where known, ongoing sources of human-caused mortality, or ambient noise levels).

Pile driving activities associated with the wharf construction project, as outlined previously, have the potential to disturb or displace marine mammals. Specifically, the specified activities may result in take, in the form of Level B harassment (behavioral disturbance) only, from underwater sounds generated from pile driving. Potential takes could occur if individuals of these species are present in the ensonified zone when pile driving is happening.

No injury, serious injury, or mortality is anticipated given the nature of the activities and measures designed to minimize the possibility of injury to marine mammals. The potential for these outcomes is minimized through the construction method and the implementation of the planned mitigation measures. Specifically, vibratory hammers will be the primary method of installation (impact driving is included only as a contingency). Vibratory pile driving does have the potential to cause injury to marine mammals, but sound pressure levels in this activity (156 dB rms) do not exceed the threshold for injury in mid-frequency cetaceans. Impact pile driving produces short, sharp pulses with higher peak levels and much sharper rise time to reach those peaks. If impact driving is necessary, implementation of soft start and shutdown zones significantly reduces any possibility of injury. Given sufficient “notice” through use of soft start (for impact driving), marine mammals are expected to move away from a sound source that is annoying prior to it becoming potentially injurious. Environmental conditions in the confined and protected Mayport turning basin mean that marine mammal detection ability by trained observers is high, enabling a high rate of success in implementation of shutdowns to avoid injury.

Effects on individuals that are taken by Level B harassment, on the basis of reports in the literature as well as monitoring from other similar activities, will likely be limited to reactions such as increased swimming speeds, increased surfacing time, or decreased foraging (if such activity were occurring) (*e.g.*, Thorson and Reyff 2006; HDR Inc. 2012). Most likely, individuals will simply move away from the sound source and be temporarily displaced from the areas of pile driving, although even this reaction has been observed primarily only in association with impact pile driving. The pile driving activities analyzed here are similar to, or less impactful than, numerous other construction activities conducted in San Francisco Bay and in the Puget Sound region, which have taken place with no reported injuries or mortality to marine mammals, and no known long-term adverse consequences from behavioral harassment. These activities are also nearly identical to the pile driving activities that took place at Wharf C-2 at NSM, which also reported zero injuries or mortality to marine mammals and no known long-term adverse consequences from behavioral harassment. Repeated exposures of individuals to levels of sound that may cause Level B harassment are unlikely to result in hearing impairment or to significantly disrupt foraging behavior. Thus, even repeated Level B harassment of some small subset of the overall stock is unlikely to result in any significant realized decrease in viability for the affected individuals, and thus would not result in any adverse impact to the stock as a whole. Level B harassment will be reduced to the level of least practicable impact through use of mitigation measures described herein and, if sound produced by project activities is sufficiently disturbing, animals are likely to simply avoid the turning basin while the activity is occurring.

The turning basin is not considered important habitat for marine mammals, as it is a man-made, semi-enclosed basin with frequent industrial activity and regular maintenance dredging. The surrounding waters may be an important foraging habitat for the dolphins, but the small area

of ensonification does not extend outside of the turning basin and into this foraging habitat (see Figure 6-1 in the Navy's application). Therefore, behavioral disturbances that could result from anthropogenic sound associated with these activities are expected to affect only a relatively small number of individual marine mammals that may venture near the turning basin, although those effects could be recurring over the life of the project if the same individuals remain in the project vicinity. In summary and as described above, the following factors primarily support our preliminary determination that the impacts resulting from this activity are not expected to adversely affect the species or stock through effects on annual rates of recruitment or survival:

- No mortality or injury is anticipated or authorized;
- Behavioral disturbance is possible, but the significance to the affected stocks is expected to be minimal due to:
  - No more than 40 days of pile driving during the authorized year;
  - The time required to drive each pile is brief, with no more than 60 seconds per pile via vibratory driving and no more than 10 minutes per pile via impact driving;
  - Mitigation (*e.g.* shut-downs and soft start) would reduce acoustic impacts to species in the area of activities;
- The absence of any significant habitat within the project area, including known areas or features of special significance for foraging or reproduction; Noise associated with pile driving will ensonify relatively small areas, the majority of which are within the industrialized turning basin.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the

monitoring and mitigation measures, NMFS finds that the total marine mammal take from the proposed activity will have a negligible impact on all affected marine mammal species or stocks.

### **Small Numbers**

As noted above, only small numbers of incidental take may be authorized under section 101(a)(5)(D) of the MMPA for specified activities other than military readiness activities. The MMPA does not define small numbers and so, in practice, where estimated numbers are available, NMFS compares the number of individuals taken to the most appropriate estimation of abundance of the relevant species or stock in our determination of whether an authorization is limited to small numbers of marine mammals. Additionally, other qualitative factors may be considered in the analysis, such as the temporal or spatial scale of the activities.

Of the 191 incidents of behavioral harassment proposed to be authorized for bottlenose dolphins, we have no information allowing us to parse the predicted incidents amongst the four stocks that may occur in the project area. Therefore, we assessed the total number of predicted incidents of take against the best abundance estimate for each stock, as though the total would occur for the stock in question. For two of the bottlenose dolphin stocks—Western North Atlantic Southern Migratory Coastal and Western North Atlantic Northern Florida coastal stock—the total predicted number of incidents of take authorized would be considered small at 5.09 percent and 21.78 percent, respectively. This estimate assumes that estimated take occurs to a new individual, which is an extremely unlikely scenario and therefore a conservative estimate, as there is likely to be some overlap in both bottlenose dolphin stocks and individuals from day to day. Likelihood of actual take to the latter Northern Florida coastal stock is relatively low, and this estimate assumes all takes would occur to this one stock. In the western North Atlantic, the Northern Florida Coastal Stock is present in coastal Atlantic waters from the Georgia/Florida

border south to 29.4° N. (Waring *et al.*, 2014), a span of more than 90 miles. There is no obvious boundary defining the offshore extent of this stock. They occur in waters less than 20 m deep; however, they may also occur in lower densities over the continental shelf (waters between 20 m and 100 m depth) and overlap spatially with the offshore morphotype (Waring *et al.*, 2014).

For the other stock, the Jacksonville Estuarine System stock, if all takes occurred to this one stock, this could take 46.36 percent of the stock (n=412). It is, however, highly unlikely that all takes would occur to this one stock due to their distribution relative to Bravo Wharf and social patterns within stock range. JES bottlenose dolphins range from Cumberland Sound at the Georgia-Florida border south to approximately Jacksonville Beach, FL, an area consisting of coastline and complex estuarine habitat of riverines and tidal marshes. Three behaviorally different communities exist within the JES stock: in estuarine waters north of St. Johns River (termed the Northern area), estuarine waters south of St. Johns River to Jacksonville Beach (the Southern area), and the coastal area (Caldwell 2001). Caldwell (2001) found that dolphins in the northern area exhibit year-round site fidelity and are the most isolated of the three communities. They are also not known to socialize with dolphins in the Southern area, which show summer site fidelity but traverse in and out of the Jacksonville area each year (Caldwell 2001). Dolphins in the coastal area are much more mobile, exhibit fluid social patterns, and show no long-term site fidelity. Furthermore, genetic analysis also supports differentiation from JES dolphins between the Northern and Southern areas (Caldwell 2011). Although members of both groups have been observed outside their preferred areas, it is likely that the majority of JES dolphins would not occur within waters ensonified by project activities. In summary, JES dolphins largely comprise two predominant groups and exhibit strong site fidelity to those areas, which does not significantly overlap with the larger ZOI, which is almost entirely confined within NSM.

Furthermore, assessing potential impacts to individuals or stocks based on take estimates alone, in the absence of further context (*e.g.* quality of surrounding habitat, site fidelity, etc.), has limitations. It is common practice to estimate how many animals are likely to be present within a particular distance of a given activity, or exposed to a particular level of sound, given the many uncertainties in predicting the quantity and types of impacts of sound on marine mammals. In practice, depending on the amount of information available to characterize daily and seasonal movement and distribution of affected marine mammals, it can be difficult to distinguish between the number of individuals harassed and the instances of harassment and, when duration of the activity is considered, it can result in a take estimate that overestimates the number of individuals harassed. In particular, for stationary activities, it is more likely that some smaller number of individuals may accrue a number of incidences of harassment per individual than for each incidence to accrue to a new individual, especially if those individuals display some degree of residency or site fidelity and the impetus to use the site (*e.g.*, because of foraging opportunities) is stronger than the deterrence presented by the harassing activity. Given stock distribution, site fidelity, social patterns, the small likelihood that all takes would occur to new individuals within this stock, and that fact that NSM does not include any particularly unique habitat to aggregate dolphins, the majority of JES dolphins are not expected to occur within ensonified waters of project activities. Therefore, proposed takes are not expected to exceed small numbers relative to stock abundance.

Based on the analysis contained herein of the proposed activity (including the proposed mitigation and monitoring measures) and the anticipated take of marine mammals, NMFS finds that small numbers of marine mammals will be taken relative to the population size of the affected species or stocks.

## **Unmitigable Adverse Impact Analysis and Determination**

There are no relevant subsistence uses of the affected marine mammal stocks or species implicated by this action. Therefore, NMFS has determined that the total taking of affected species or stocks would not have an unmitigable adverse impact on the availability of such species or stocks for taking for subsistence purposes.

## **National Environmental Policy Act**

To comply with the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq.*) and NOAA Administrative Order (NAO) 216-6A, NMFS must review our proposed action (*i.e.*, the issuance of an incidental harassment authorization) with respect to potential impacts on the human environment.

This action is consistent with categories of activities identified in CE B4 of the Companion Manual for NOAA Administrative Order 216-6A, which do not individually or cumulatively have the potential for significant impacts on the quality of the human environment and for which we have not identified any extraordinary circumstances that would preclude this categorical exclusion. Accordingly, NMFS determined that the issuance of this Authorization was categorically excluded from further NEPA review.

## **Endangered Species Act (ESA)**

Section 7(a)(2) of the Endangered Species Act of 1973 (ESA: 16 U.S.C. 1531 *et seq.*) requires that each Federal agency insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat.

No incidental take of ESA-listed species is authorized or expected to result from this activity. Therefore, NMFS has determined that consultation under Section 7 of the ESA is not required for this action.

### **Authorization**

NMFS has issued an IHA to the Navy for the harassment of small numbers of bottlenose dolphins incidental to the Bravo Wharf recapitalization project in NSM, Jacksonville, FL, provided the previously mentioned mitigation, monitoring, and reporting requirements.

Dated: February 27, 2018.

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Donna Wieting,

Director, Office of Protected Resources,

National Marine Fisheries Service.

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